
Space Weather Forecast

Issued on Monday 30 September 2024 at 01:14 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Moderate-class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity is Moderate with a Moderate-class flare observed from a complex sunspot region in the southeast of the Earth-facing disc.

There are currently eight sunspot regions on the visible disc. The most notable remains the aforementioned region in the southeast of the disc, which has shown some development, with further complexity becoming apparent as it rotates into a better viewing angle. This region contains a weak 'delta spot' on the southern periphery of its main leader spot and was responsible for the largest flare of the period. Two sunspot regions located in the southwest quadrant have continued to slowly mature, with any growth having now stalled. A sunspot group located near south-centre disc continues to be a broad area of mainly negative polarity spots, with one very small positive spot in its northern portion, resulting in a non-standard but inactive and mature configuration. A new sunspot rapidly developed in the southeast, although appears to have stabilised. All other remaining regions appear to be small and simple, or showing signs of decay.

A coronal mass ejection (CME) was observed off the southwest limb in association with a long duration Common-class flares. Results show the CME missing ahead of Earth's orbit.

Solar Wind / Geomagnetic Activity: Solar winds started the period at background levels, near 300km/s, before increasing to slightly elevated levels, peaking near 500km/s at 29/2137 UTC, due to connection with a coronal hole fast wind. The Magnetic Field was initially weak, increasing to moderate, with a brief strong interval, at 29/1450 UTC, ahead of coronal hole fast wind. The north-south component was mostly negative (southward directed) early in the period, before re-orientating to become predominately positive (northward directed) from 29/1200 UTC, with brief negative intervals. Geomagnetic activity was mostly Quiet to Unsettled, with an Active interval observed between 29/1200-1500 UTC due to coronal hole fast wind influences.

Energetic Particles / Solar Radiation: The count rate of energetic particles remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected, with a chance of further isolated Moderate class flares. There is a very slight chance of a Strong flare from the complex sunspot region located

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in the southeast.

Solar Wind / Geomagnetic Activity: There are no Earth directed CMEs in the forecast. Solar winds are likely to remain slightly elevated on Day 1 (30 Sep) due to coronal hole fast wind influences, before returning to background levels on Day 2 (01 Oct). Mainly Quiet (Kp 0-2) geomagnetic conditions are expected, but with a chance of Unsettled to Active (Kp 3-4) intervals possible from CH fast wind influences on Day 1 (30 Sep).

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to persist at background levels, with no solar radiation storms occurring.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	No	50	50	50	50
Very Active	R3-R5 (X Class)	No	10	10	10	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						